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(54) METHOD FOR THE MANUFACTURE OF MEDIUM-LENGTH TRIGLYCERIDE EMULSION COMPOSITION

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CLAIM

A method for the manufacture of an emulsion composition by mixing and emulsifying less than 20 parts by weight of an oil mixture, consisting of 40-99.9 wt% of a medium-length triglyceride and 0.1-60 wt% of sucrose isobutyl acetate or polyglycerol acetate, and more than 80 parts by weight of less than a 40-wt% natural gum aqueous solution.

DETAILED EXPLANATION OF THE INVENTION

The present invention concerns emulsion compositions, and more specifically concerns medium-length triglyceride emulsion compositions with a very high emulsion stability.

Medium-length triglycerides are absorbed by the digestive organs more rapidly than natural oils-fats and are mainly transported from the portal vessels and absorbed well even in the state of bile deficiency. It has been known that most of the absorbed medium-length triglycerides immediately undergo oxidative decomposition and are metabolized to form carbon dioxide. Utilizing such characteristics, the medium-length triglycerides are used for symptoms of poor fat absorption and as a post-surgery energy supplement.

The medium-length triglycerides have been developed in a convenient intake form for humans, such as oils, powdered oil-fat, tablets, capsules, etc. Conventionally, the application of medium-length triglycerides in the form of emulsions has been desirable. However, the medium-length triglycerides have molecular weights of about one-half that of natural oils-fats, with a low viscosity and surface tension and very low melting point, thus it is very difficult to obtain stable medium-length triglyceride emulsions.

As a result of an intense investigation of emulsification methods for easy handling of medium-length triglycerides, we have discovered a method for obtaining stable medium-length triglyceride emulsion compositions.

Namely, the present invention concerns a method for the manufacture of an emulsion composition by mixing and emulsifying less than 20 parts by weight of an oil mixture, consisting of 40-99.9 wt% of a medium-length triglyceride and 0.1-60 wt% of sucrose isobutyl acetate or polyglycerol acetate, and more than 80 parts by weight of less than a 40-wt% natural gum aqueous solution.

The medium-length trilgycerides that can be used in the present invention are triglycerides of a fatty acid chosen from caproic acid, caprylic acid, and capric acid; triglycerides of two or more fatty acids can also be used. Such fatty acids may also contain less than 7 wt% of lauric acid.

Sucrose isobutyl acetate or polyglycerol acetate is added in an amount of 0.1-60 wt% to the medium-length triglycerides. Below 0.1 wt%, the emulsion stability is poor, while above 60 wt%, the emulsions have a poor taste.

When the content of the oil mixture consisting of 40-99.9 wt% of a medium-length triglyceride and 0.1-60 wt% of sucrose isobutyl acetate or polyglycerol acetate exceeds 20 parts by weight in the emulsion compositions, the emulsion stability is poor.

The natural gum may be gum arabic, xanthan gum, tracaganth gum, guar gum, locust bean gum, etc. They may be used alone or as mixtures thereof. It is desirable for the natural gum concentration to be below 40 wt%. Above 40 wt%, obtaining uniform solutions is difficult due to the high viscosity. In the emulsion compositions, less than 80 parts by weight of the less than 40-wt% natural gum aqueous solution is used; beyond this range, the emulsions are not stable.

Furthermore, one or more food emulsifiers such as lecithin, glycerin fatty acid esters, sucrose fatty acid esters, sorbitan fatty acid esters, etc., may be added to the emulsion compositions of the present invention.

The medium-length triglyceride emulsion compositions obtained by the present invention have a very high emulsion stability and a good taste. Furthermore, the emulsion compositions obtained by the present invention are characterized by having very high a emulsion stability even when used in beverages, aqueous emulsified medicines, etc.

The emulsion compositions of the present invention may be taken directly or as emulsified solutions and also can be used after being mixed with a fragrance, natural fruit juice, natural color, etc. Since the emulsion compositions of the present invention can be easily, transported, they can be carried around by the person.

Next, the present invention is explained with examples.

APPLICATION EXAMPLE 1

Sucrose isobutyl acetate or polyglycerol acetate was added to a medium-length triglyceride (triglyceride of a mixed fatty acid consisting of 60 wt% of caprylic acid and 40 wt% of capric acid) and heated at 70°C for dissolution. The oil mixture thus obtained was added to a gum arabic or xanthan gum aqueous solution, treated with a sucrose fatty acid ester (HLB of about 16) if needed, then stirred and emulsified using a machine; 100 g of the resulting uniform emulsion were then placed in a tall beaker (200 mL), which was then stoppered, allowed to stand 1 month at room temperature, and evaluated for emulsion stability. Results are shown in Table I.

Table I shows that the emulsion compositions of the present invention have an excellent emulsion stability.

APPLICATION EXAMPLE 2

A refreshment beverage containing pineapple juice was prepared by mixing 5 g of the emulsion composition of sample No. 5 obtained in Application Example 1, 1.3 g of citric acid, 70 g of sugar, 100 g of natural pineapple juice, and 300 g of water. Even after being stored for a month at room temperature, the sports drink obtained exhibited a good emulsion stability and a good taste.

Table I: Emulsion composition stability

Sample No.	1	2	3	4	5	6	7	8
Oily mixture concentration (wt%)	5	10	10	20	20	25	30	10
Emulsion composition								
Medium-length triglyceride (g)	25	80	70	150	240	150	140	100
Sucrose isobutyl acetate (g)	25		30	100	10	100	110	
Polyglycerol acetate (g)		20						
30% gum arabic aqueous solution (g)	950			1000				
20% gum arabic aqueous solution (g)		900			1000		583	
10% xanthan gum aqueous solution (g)			900			750		900
Sucrose fatty acid ester (g)	1	1	1		1.25		1	1
Emulsion stability	○	○	○	○	○	△	×	×

Notes) ○: emulsion state
△: somewhat separated
×: separation